

CLAIMS

What is claimed is:

1. A composition comprising: ✓

a) about 0.3 wt% to about 15 wt% of hydrogen peroxide;

5 b) water; and

c) a stabilizer system comprising:

i) about 10 ppm by weight to about 1 wt% of a stannate stabilizer;

10 ii) about 10 ppm by weight to about 1 wt% of a phosphonic acid chelating agent or a mixture of phosphonic acid chelating agents; and

iii) about 10 ppm by weight to about 1 wt% of an aromatic chelating agent or a mixture of aromatic chelating agents;

in which:

15 the composition comprises less than about 10 ppm of pyrophosphate; and
the composition has a pH greater than 7.0.

2. The composition of claim 1 in which the composition has a pH of about 8.0 to about 10.5.

20 3. The composition of claim 1 in which the composition comprises less than about 1 ppm of pyrophosphate.

4. The composition of claim 3 in which the stabilizer system comprises about 15 ppm to about 2500 ppm of the stannate stabilizer, about 15 ppm to about 2500 ppm of the phosphonic acid chelating agent or the mixture of phosphonic acid chelating agents, and about 15 ppm to about 2500 ppm of the aromatic
25 chelating agent or the mixture of chelating agents.

5. The composition of claim 4 in which:

the phosphonic acid chelating agent is selected from the group consisting of

amino tri(methylene phosphonic acid); diethylene triamine penta(methylene phosphonic acid); hexamethylene diamine tetra(methylene phosphonic acid); bis hexamethylene triamine penta methylene phosphonic acid; 1-hydroxyethylidene-1,1-diphosphonic acid, and mixtures thereof; and

5 the aromatic chelating agent is selected from the group consisting of salicylic acid, 6-hydroxy-picolinic acid, 8-hydroxy-quinoline, and mixtures thereof.

6. The composition of claim 5 in which stabilizer system comprises about 20 ppm to about 1000 ppm of the stannate stabilizer, about 20 ppm to about 1000 ppm of the phosphonic acid chelating agent or the mixture of phosphonic
10 acid chelating agents; about 20 ppm about to 1000 ppm of the aromatic chelating agent or the mixture of chelating agents.

7. The composition of claim 6 in which the composition has a pH of 9.0 to 9.5.

8. The composition of claim 7 in which the stabilizer system comprises
15 about 30 ppm to about 200 ppm of the stannate stabilizer; about 30 ppm to about 200 ppm of the phosphonic acid chelating agent or mixture of phosphonic acid chelating agents; and about 30 ppm to about 200 ppm of the aromatic chelating agent or mixture of aromatic chelating agents.

9. The composition of claim 8 in which the phosphonic acid chelating
20 agent is selected from the group consisting of 1-hydroxyethylidene-1,1-diphosphonic acid, amino tri(methylene phosphonic acid), diethylene triamine penta(methylene phosphonic acid), and mixtures thereof; and the aromatic chelating agent is selected from the group consisting of 8-hydroxy-quinoline and salicylic acid.

25 10. The composition of claim 2 in which:

 the phosphonic acid chelating agent is selected from the group consisting of amino tri(methylene phosphonic acid); diethylene triamine penta(methylene phosphonic acid); hexamethylene diamine tetra(methylene phosphonic acid); bis hexamethylene triamine penta methylene phosphonic acid; 1-hydroxyethylidene-

1,1-diphosphonic acid, and mixtures thereof; and

the aromatic chelating agent is selected from the group consisting of salicylic acid, 6-hydroxy-picolinic acid, 8-hydroxy-quinoline, and mixtures thereof.

11. The composition of claim 10 in which the composition comprises
5 less than about 1 ppm of pyrophosphate.

12. The composition of claim 1 in which the composition additionally comprises about 0.25 wt% to about 25 wt% of a surfactant or mixture of surfactants.

13. The composition of claim 12 in which the composition has a pH of
10 about 8.0 to about 10.5.

14. The composition of claim 13 in which the composition comprises less than about 1 ppm of pyrophosphate.

15. The composition of claim 14 in which the stabilizer system comprises about 15 ppm to about 2500 ppm of the stannate stabilizer, about 15 ppm to about
15 2500 ppm of the phosphonic acid chelating agent or the mixture of phosphonic acid chelating agents, and about 15 ppm to about 2500 ppm of the aromatic chelating agent or the mixture of chelating agents.

16. The composition of claim 15 in which:

the phosphonic acid chelating agent is selected from the group consisting of
20 amino tri(methylene phosphonic acid); diethylene triamine penta(methylene phosphonic acid); hexamethylene diamine tetra(methylene phosphonic acid); bis hexamethylene triamine penta methylene phosphonic acid; 1-hydroxyethylidene-1,1-diphosphonic acid, and mixtures thereof; and

the aromatic chelating agent is selected from the group consisting of
25 salicylic acid, 6-hydroxy-picolinic acid, 8-hydroxy-quinoline, and mixtures thereof.

17. The composition of claim 16 in which stabilizer system comprises about 20 ppm to about 1000 ppm of the stannate stabilizer, about 20 ppm to about 1000 ppm of the phosphonic acid chelating agent or the mixture of phosphonic

acid chelating agents; about 20 ppm about to 1000 ppm of the aromatic chelating agent or the mixture of chelating agents.

18. The composition of claim 17 in which the composition has a pH of 9.0 to 9.5.

5 19. The composition of claim 18 in which the stabilizer system comprises about 30 ppm to about 200 ppm of the stannate stabilizer; about 30 ppm to about 200 ppm of the phosphonic acid chelating agent or mixture of phosphonic acid chelating agents; and about 30 ppm to about 200 ppm of the aromatic chelating agent or mixture of aromatic chelating agents.

10 20. The composition of claim 19 in which the phosphonic acid chelating agent is selected from the group consisting of 1-hydroxyethylidene-1,1-diphosphonic acid, amino tri(methylene phosphonic acid), diethylene triamine penta(methylene phosphonic acid), and mixtures thereof; and the aromatic chelating agent is selected from the group consisting of 8-hydroxy-quinoline and
15 salicylic acid.

21. The composition of claim 20 in which the composition additionally comprises a thickening agent.

22. The composition of claim 14 in which:

the phosphonic acid chelating agent is selected from the group consisting of
20 amino tri(methylene phosphonic acid); diethylene triamine penta(methylene phosphonic acid); hexamethylene diamine tetra(methylene phosphonic acid); bis hexamethylene triamine penta methylene phosphonic acid; 1-hydroxyethylidene-1,1-diphosphonic acid, and mixtures thereof; and

the aromatic chelating agent is selected from the group consisting of
25 salicylic acid, 6-hydroxy-picolinic acid, 8-hydroxy-quinoline, and mixtures thereof.

23. A method of cleaning a surface, the method comprising the steps of:

(1) applying a composition to the surface, the composition comprising:

a) about 0.3 wt% to about 15 wt% of hydrogen peroxide;

- b) water;
- c) about 0.25 wt% to about 25 wt% of a surfactant or mixture of surfactants;
- d) about 0.25 wt% to about 3.0 wt% of a thickening agent or a mixture of thickening agents; and
- e) a stabilizer system comprising:
 - i) about 10 ppm by weight to about 1 wt% of a stannate stabilizer;
 - ii) about 10 ppm by weight to about 1 wt% of a phosphonic acid chelating agent or a mixture of phosphonic acid chelating agents; and
 - iii) about 10 ppm by weight to about 1 wt% of an aromatic chelating agent or a mixture of aromatic chelating agents;

in which:

the composition comprises less than about 10 ppm pyrophosphate; and

the composition has a pH greater than 7.0; and

(2) removing the composition.

24. The method of claim 23 in which in which

the composition has a pH of about 8.0 to about 10.5;

the composition comprises about 20 ppm to about 1000 ppm of the stannate stabilizer, about 20 ppm to about 1000 ppm of the phosphonic acid chelating agent or the mixture of phosphonic acid chelating agents; about 20 ppm about to 1000 ppm of the aromatic chelating agent or the mixture of chelating agents; and

the phosphonic acid chelating agent is selected from the group consisting of

amino tri(methylene phosphonic acid); diethylene triamine penta(methylene phosphonic acid); hexamethylene diamine tetra(methylene phosphonic acid); bis hexamethylene triamine penta methylene phosphonic acid; 1-hydroxyethylidene-1,1-diphosphonic acid, and mixtures thereof; and the aromatic chelating agent is
5 selected from the group consisting of salicylic acid, 6-hydroxy-picolinic acid, 8-hydroxy-quinoline, and mixtures thereof.

25. The method of claim 24 in which the composition comprises less than about 1 ppm of pyrophosphate.

26. A method of preparing a stabilized basic aqueous hydrogen peroxide
10 composition, the method comprising the steps of:

providing a concentrate comprising about 30% to about 70% hydrogen peroxide, about 100 ppm by weight to about 3 wt% of a stannate stabilizer; about 100 ppm by weight to about 1.5 wt% of a phosphonic acid chelating agent or a mixture of phosphonic acid chelating agents; and about 100 ppm by weight to
15 about 1.5 wt% of an aromatic chelating agent or a mixture of aromatic chelating agents;

diluting the concentrate with water, with aqueous base, or with both water and aqueous base to form the stabilized basic aqueous hydrogen peroxide composition;

20 in which:

the stabilized basic aqueous hydrogen peroxide composition has a pH greater than 7.0,

the stabilized basic aqueous hydrogen peroxide composition comprises about 0.3 wt% to about 15 wt% of hydrogen peroxide; and

25 the stabilized basic aqueous hydrogen peroxide composition comprises less than about 10 ppm of pyrophosphate.

27. The method of claim 26 in which in which the stabilized basic aqueous hydrogen peroxide composition has a pH of about 8.0 to about 10.5.

28. The method of claim 27 in which the stabilized basic aqueous hydrogen peroxide composition comprises about 20 ppm to about 1000 ppm of the stannate stabilizer; about 20 ppm to about 1000 ppm of the phosphonic acid chelating agent or the mixture of phosphonic acid chelating agents; about 20 ppm
5 about to 1000 ppm of the aromatic chelating agent or the mixture of chelating agents; and less than about 1 ppm of pyrophosphate.

29. The method of claim 28 in which:

the phosphonic acid chelating agent is selected from the group consisting of amino tri(methylene phosphonic acid); diethylene triamine penta(methylene
10 phosphonic acid); hexamethylene diamine tetra(methylene phosphonic acid); bis hexamethylene triamine penta methylene phosphonic acid; 1-hydroxyethylidene-1,1-diphosphonic acid, and mixtures thereof; and

the aromatic chelating agent is selected from the group consisting of salicylic acid, 6-hydroxy-picolinic acid, 8-hydroxy-quinoline, and mixtures thereof.

15 30. The method of claim 27 in which the composition comprises less than about 1 ppm of pyrophosphate.